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**Coup d'Etat:  
Military Geography and The Operational Level of War**

**A Monograph  
by  
Major John O'Brien  
Infantry**

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## ABSTRACT

COUP D'OEIL: MILITARY GEOGRAPHY AND THE OPERATIONAL LEVEL OF WAR by MAJ John J. O'Brien, USA, 58 pages.

This monograph focuses on the geographic component of the contemporary intelligence process at the operational level of war. The concept of coup d'oeil, the intellectual capacity of military commanders to evaluate geography and apply that evaluation to the successful prosecution of war, serves as the unifying theme throughout the monograph. The research question is to examine how to better the coup d'oeil of the commander at the operational level of war.

The theoretical nature of coup d'oeil is examined to establish the basis of the relationship between geography and warfare. Recognizing that the classical theorists based their theories on the model of the Napoleonic campaign, a comparison is made between Napoleonic strategy and modern operational art. The salient difference between the two is that whereas Napoleonic strategy sought to bring all resources against the decisive point at the decisive time in one decisive battle, operational art is extended in time and in space beyond one decisive battle. The operational commander sets conditions for tactical execution by his subordinates, while at the same time planning to exploit the new conditions established by tactical results.

The changing international security paradigm brought on by the collapse of Communism in the 1980s and 1990s suggests that the most likely future role of United States Forces will be one of regional crises response. Highlighted in the new paradigm is the increasing role of the operational level of war commander. Though he has a methodology for campaign design, missing at the operational level is a methodology to analyze quickly, accurately and appropriately, the key elements of terrain in his theater of operations.

An organized application of geographical information appropriate for the operational level of war must not be so descriptive as to be useless, nor should it be restricted to the rather specific and local elements of tactical terrain analysis. The monograph suggests that access, mobility, visibility, communicability, availability, and vulnerability are the appropriate elements of operational terrain analysis. "Operation Neptune" and the subsequent break out from the Normandy beachhead is used as a historical case study to examine these elements in support of a campaign design.

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## INTRODUCTION

The focus of this monograph is to examine the geographic component of the contemporary intelligence process at the operational level of war. The French term "coup d'oeil" (an eye for the ground), coined by Frederick the Great, appears to symbolize the intellectual capacity of military commanders to evaluate geography and apply that evaluation to the successful prosecution of war. Coup d'oeil, as a term used by the classical theorists, has never been limited to merely "geography" as we may have understood the term from our grade school experience where "geography" may have meant the memorization of terms such as "island", and "peninsula". Coup d'oeil views geography as the relationship among what a commander can do with the ground, what his opponent can do with the ground, and how they will interact on the ground. (1)

Geography and war have long been bedfellows. At the Battle of Megiddo, 1479 B. C., the Egyptian Pharaoh, Thutmose III, "was advised by a staff of the location and intentions of the enemy and of the terrain to his front." (2) War occurs on or near the surface of the earth; geography is the science which seeks to describe what is on or near the surface of the earth. A common theme throughout military history is that the commander who better understands all that the geography of the battle area implies, and uses it to his advantage, is the commander most likely to win the battle.

There are many ways to describe the science of geography. In its most basic form it is a descriptive science. It may be crudely described as "What's where? Why? (and so what?)." (3) Geography in its philosophical and most general sense constitutes the study of empirical knowledge from the viewpoint of the spatial distribution of phenomena on or near the surface of the earth. (4) Modern geography has become more than merely a descriptive science. It can have an interpretative and prognostic nature too. While geography commonly deals with the visible landscape, it is interested in all those factors which give personality to a place. (5)

Many lengthy studies have been undertaken in an attempt to validate a sub-discipline of "military geography" within the larger body of geography proper. (6) Whether or not there is a legitimate sub-discipline of military geography within the science of geography is a debate internal to the community of geographers. What is evident without debate however, is that

geography is a related discipline of military art and science. Traditionally, this application has resided in the field of military intelligence. "Military geography and military intelligence are fields so closely related that confusion frequently exists as how one differs from the other." (7)

The three traditional manifestations of geography in military intelligence are environmental studies, regional studies, and terrain analysis. Environmental studies provide systemic data about climate and conditions which affect the development and procurement of equipment, logistics, organization, and doctrine. Regional studies provide descriptive and interpretative information about landscape, infrastructure, culture, economics, sociology, and political structure of a geographic area. Terrain analysis makes use of map studies. The broad categorizations of map studies are geographic studies, chorographic studies, and topographic studies. Military art and science addresses the same general categories by the names of strategic analysis, theater analysis, and topographic analysis. These military categories reflect not only scale, but levels of war at the strategic, operational, and tactical level.

Figure 1 illustrates the contemporary, conceptual framework for understanding how geographic science is integrated into the overall intelligence effort. The framework attempts to capture the relationship between friendly and enemy forces in the operating environment.

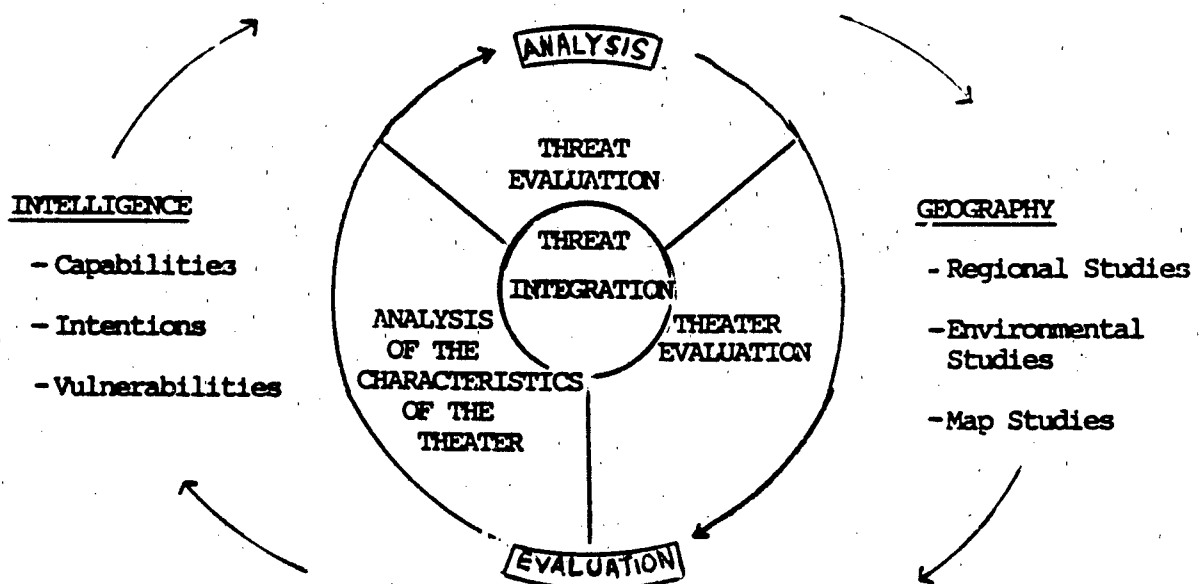


FIGURE 1 (The Intelligence Process) (8)

The internal rings identify the components of the intelligence process at the operational level of war. The middle ring identifies a continuous process of Analysis-Evaluation-Analysis as new information is received and the situation develops. The external ring identifies the continuous relationship between geographic information and intelligence information.

The integration of modern intelligence gathering technology and modern techniques of terrain analysis derived from the science of geography have resulted in a tremendously powerful analytical tool called "Intelligence Preparation of the Battlefield" (IPB). At the tactical level, this tool produces for the commander and staff a set of graphic products which could nearly be called "visual tactical coup d'oeil".

As the IPB process was being introduced in the early 1980s to the tactical level of the US Army, a doctrinal debate was occurring at the senior level of Army leadership concerning the reintroduction of the operational level of war or "operational art" into Army doctrine. As both concepts matured, attempts to apply the IPB process to the operational level of war have generally proven unsatisfactory. (9) There remains therefore, a tremendous void about how to best support the operational level commander with an equivalent and appropriate level of intelligence support. The question to be pursued in this monograph will be to examine if a better understanding of the geographic component of operational intelligence can help to fill this void.

The concept of coup d'oeil, defined as the intellectual capacity of military commanders to evaluate geography and apply that evaluation to the successful prosecution of war, will serve as the unifying theme throughout this monograph. The methodology will be to first explore the theoretical nature of coup d'oeil. The second step will be to carry the concept forward as evidenced in the Intelligence Preparation of the Battlefield (IPB) process. The third step will be to examine the changing nature of war and the new international security paradigm of the post Cold War world. This third step in the examination highlights the increasing visibility of the operational level of war as distinguished from the strategic level of war and the tactical level of war.

With a clear distinction made between the strategic and operational levels of war, I will suggest the elements of operational level of war coup d'oeil which will satisfy the research question. "Operation Neptune", the



invasion of Normandy, 6 June 1944, will be used as a historical example to analyze the effectiveness of the proposed elements of operational coup d'oeil. "Neptune" provides an excellent case study first because of the clear distinction between the strategic and operational levels of war, and secondly because of the tremendous influence of geography in the planning process.

By definition, operational art involves fundamental decisions about when and where to fight and whether to accept or decline battle. At the operational level of war the commander must discern the answers to three fundamental questions: what conditions must be produced to achieve the strategic goal; what sequence of actions is most likely to produce that condition; and how should resources of the force be applied to accomplish that sequence of actions. (10) Any criteria to assess the degree of assistance geography might add to the commander's coup d'oeil must parallel this design. The criteria for this assessment will be:

- 1) Military geography must be able to assist the commander to envision the military end state, where his forces must be at the conclusion of the event which attains the desired end state.
- 2) Military geography must be able to assist the commander to envision a sequence of events in the medium of time, space, and mass which gets his forces to the desired end state.
- 3) Military geography must be able to assist the commander to envision how to apply resources, operational and logistical, which will carry the force through the sequence of events with sufficient strength to achieve the desired end state.

With this criteria in mind, we will begin with an exploration of the theoretical relationship between warfare and geography by examining the nature of coup d'oeil.

### THE NATURE OF COUP D'OEIL

Every day I feel more and more in need of an atlas, as geography in the minutest details is essential to a true military education. I wish therefore, you would procure me the best geography and atlas extant. (1)

Gen. William T. Sherman

Lieutenant William T. Sherman requested the "best geography and atlas extant" from his soon to be brother-in-law in the year 1844. In the years prior to the American Civil War, Lieutenant Sherman was assigned to Fort Moultrie, South Carolina. On this terrain, over which he was to lead a Union army twenty years later, Lieutenant Sherman developed what was to become an exceptionally keen sense of military geography. His biographer wrote of these years: "the details of the ground were fixed in his memory on long horseback rides that he took alone... it was his habit, almost his passion, to study the slopes, curves, and stretches of terrain... a habit born of a singular fondness for the earth." (2)

Military geographers cite the habits of this famous Union general as an example of the utility which geography can provide to a military leader. (3) Past masters of the military art have likewise reflected the primacy of a practical knowledge of the science of geography as a fundamental skill of generalship. Frederick the Great stated in his Instructions: "Knowledge of a country is to a general what a rifle is to an infantryman and what the rules of arithmetic are to a geometrician". (4) Napoleon, whose actions spoke with much more clarity than his written Maxims, was extremely thorough in his planning. "As soon as the possibility of a war arose, the Emperor would send for his librarian and demand a comprehensive series of books - historical, descriptive, geographical, and topical - which he would read... building up a clear mental picture of his future opponent." (5) Awareness of the centrality of geography to the military art extends to our current United States Army doctrine with the simple statement found in FM 100-5 (Operations), "understanding the limitations and opportunities of terrain is a fundamental military skill." (6)

Geographers have said the soldier uses geography unconsciously, without even realizing that he is doing so. (7) Some however, do better than others. Skillful use of geography applied to a military purpose was termed coup d'oeil

by Frederick the Great. He defined coup d'oeil of a general as, "the talent which great men have of conceiving in a moment all the advantages of the terrain and the use they can make of it with their army." (8) Frederick further refined his definition to include three key elements. First, it is a judgment about, "the ground you can occupy with a certain number of troops". Second, it is a "perception of the advantages of terrain". Third, judgment "is exercised about the capacity of the enemy...". (9)

The term coup d'oeil continued to have a geographic connotation about the commander's judgment and perception of the inter-action of opposing forces on terrain. The term appeared frequently in 19th Century military theory. Baron Antoine Henri Jomini, whose theory of war depended so greatly on striking the decisive point with a coordinated massing of overwhelming force, referred to a failure to recognize this point as possibly a "defective coup d'oeil militaire". (10) Jomini highlighted that, "if a general desires to be a successful actor in the great drama of war, his first duty is to study carefully the theater of operations so that he may see clearly the relative advantages and disadvantages it presents for himself and his enemies." (11) To study carefully the theater of operations implies a heavy emphasis on a study of the geography of the theater. Geography alone however, is not coup d'oeil. It is possible to understand all that can be known about the strategic situation, yet fail to subdue the opponent. Coup d'oeil is found in the application of military force across the geography of the theater to achieve the desired strategic end state. If the general be "not possessed of military coup d'oeil, he may make an excellent strategic plan and be entirely unable to apply the rules of tactics in the presence of an enemy." (12)

Carl von Clausewitz recognized coup d'oeil as "an indispensable quality" of the general.

If the mind is to emerge unscathed from this relentless struggle with the unforeseen, two qualities are indispensable: first, an intellect that, even in the darkest hour retains some glimmerings of the inner light which leads to truth; and second, the courage to follow that faint light wherever it may lead. The first is described by the French term coup d'oeil, the second is determination. (13)

Clausewitz began his discussion of coup d'oeil by describing it as "the idea of a rapid and accurate decision... based on an evaluation of time and space". He did differ with the reference of his day which limited Coup d'oeil to "visual estimates only." (14) He expanded the definition to include, "any sound decision taken in the midst of action - such as recognizing the right point of attack, etc." (15) Clausewitz also added an operational meaning to coup d'oeil because "it must also have its place in strategy, since here as well quick decisions are often needed." (16)

Clausewitz introduced his definition of coup d'oeil in a rather grandiose literary style, "an intellect that even in the darkest hour retains some glimmerings of the inner light which leads to truth." As a result of of his literary style coup d'oeil is often taken out of context to mean something more than what it appears Clausewitz meant. When the metaphor is stripped away however, "the concept merely refers to the quick recognition of a truth that the mind would ordinarily miss or would perceive only after long study and reflection." (17) The "truth" to which he refers is firmly linked to terrain. Coup d'oeil is of the intellect. Determination is of the temperament. "Determination, which dispels doubt, is a quality that can be aroused only by the intellect." (18) "Of the attributes that a great commander needs in war, there is only one which is not related to temperament, and involves merely the intellect, "I mean the relationship between warfare and terrain." (19)

Discussing the trap of falling victim to pure theory, Clausewitz again resorts to his literary style and suggests that a student of war should not, "be irresistibly dragged down to a state of dreary pedantry and grub around in the underworld of ponderous concepts where no great commander, with his effortless coup d'oeil, was ever seen." (20) In the more direct language he used to emphasize a point, Clausewitz sums up his regard for this quality by stating in the introduction to his final chapter of On War (Book 8: War Plans), "when all is said and done, it is really the commander's coup d'oeil, his ability to see things simply, to identify the whole business of war completely with himself, that is the essence of good generalship." (21)

Clausewitz, Frederick, Napoleon, and Jomini saw a centrality to the cataclysmic and decisive battle in warfare. Their theories are representative of an attrition oriented approach to battle. By contrast, a maneuver

oriented approach to battle has been articulated and represented by theorists such as B. H. Liddel Hart and William S. Lind. (22) The roots of Liddel Hart's "indirect approach", and Lind's "maneuver warfare", lie with the great Chinese philosopher of war, Sun Tzu.

Sun Tzu, who wrote around 500 B.C., never used the French term coup d'oeil. He did however, articulate the same concept. Samuel B. Griffith, the translator and commentator of Sun Tzu's, The Art of War, observes of the Chinese culture, "The Chinese have always had a special feeling for nature. This is reflected in their painting, history, poetry, and other literature. Possibly the ability of their great soldiers to use terrain to best advantage derives from this apparently innate appreciation of it." (23)

Sun Tzu identified five elements of the art of war. These were the measurement of space, estimates of quantities, calculations, comparisons, and chances of victory.

Measurements of space are derived from the ground.... Quantities derived from measurement, figures from quantities, comparisons from figures, and victory from comparisons.... 'Ground' includes both distance and type of terrain; 'measurement' is calculation. Before the army is dispatched, calculations are made respecting the degree of difficulty of the enemy's land; the directness and deviousness of its roads; the number of troops; the quantity of his war equipment and the state of his moral. (24)

In Sun Tzu's conception, the elements of war make up a relationship. The relationship is between calculations about the enemy, calculations about the march, and calculations about the terrain on which the battle is to be fought. "A general who is ignorant of even one of these matters is unfit for command." (25)

The nature of coup d'oeil, as has been described by the theorists, is that of a quality of the intellect. It is an intellectual quality required of the general. This quality of the intellect enables the general to appraise the enemy, to appraise the advantages and disadvantages of a piece of terrain, and to visualize the time-space relationship between the opposing forces. Frederick and Clausewitz imply this quality is an individual talent resulting from training. Jomini and Sun Tzu imply the quality results from methodical calculation conducted by the commander and a staff. All the

theorists agree however, that coup d'oeil as has been defined, is a fundamental quality of the superior general.

### THE EXERCISE OF COUP D'OEIL

Twenty years after requesting an atlas and geography from his brother-in-law, General William T. Sherman submitted an extraordinary dispatch from Savannah, Georgia, to General U.S. Grant. Concerning the progress of his "March to the Sea", General Sherman wrote:

I think our campaign of the last month, as well as every step that is taken from this point northward, is as much a direct attack upon Lee's army as though we were operating within the sound of his artillery. (1)

Sherman's dispatch was extraordinary because it captured in a sentence the embryonic notion of the evolution of warfare from classic Napoleonic strategy to what we now call "operational art". (2) "Sherman, with Grant's active involvement, gave the most spectacular display of the growing search for an alternative [to static warfare] through strategic maneuver." (3) What was new about this form of warfare being waged by the generals of the North was that, "Sherman and Grant exploited diversion, dispersion, and surprise to pursue successfully a modern total war strategy of exhaustion against the enemy's resources, communications, and will." (4) The effect of severing Lee's Army of Virginia from its industrial and logistics base demonstrated operational coup d'oeil. Sherman's knowledge of the terrain and geography of the South enabled him to avoid battle with Confederate General Joe Johnson while at the same time allowing him to strike at key targets within the infrastructure of the Southern States. The destruction of this infrastructure denied Lee use of the rail system, cut his lines of support, and broke the will of the Southern populace to continue a losing effort.

Historian G. Murphy Donovan noted two great lessons from the Civil War appropriate to the study of operational art:

In the early years of the Civil War, Lincoln had to fire his high commanders after nearly every major battle. Good logisticians and engineers (military scientists) were common enough, but Lincoln couldn't find commanders (military artists) who had experience with or aptitude for,

the successful orchestration of forces larger than division or corps... the second great lesson is that we keep forgetting this. (5)

Any reasonable history of the doctrinal debate which occurred in the US Army between the 1976 edition of Field Manual 100-5 (Operations), through the 1982 and 1986 revisions of this capstone doctrinal manual, bears witness to the depth of the efforts on the part of the Army's leaders to come to grips with the lessons of operational art and the practice of the art at the operational level of war. Describing this revolution, Lieutenant Colonel (now Colonel) L.D. Holder stated, "the adoption of operational art may be the most important change in Army doctrine since World War II." (6) Holder suggested, "senior officers will have to master an important subject which has been neglected for a generation... they will have to overcome an entrenched habit of thinking solely in tactical terms." (7)

"Thinking solely in tactical terms" however, was not without merit. Many significant advances in tactical technique and procedure were developed while the day to day army was narrowly focused on "preparing for the next battle", a term which further highlights the intense tactical focus of official doctrinal literature of the period. Perhaps one of the better known procedural innovations developed was "Intelligence Preparation of the Battlefield", (IPB).

IPB is an analytical methodology employed to reduce that great frustration of all commanders - uncertainty. The IPB process integrates enemy doctrine with weather and terrain to determine and evaluate the enemy capabilities and vulnerabilities in the form of templates, map, and graphic products that allow the commander to compare his own course of action vs. probable enemy courses of action. This knowledge ideally should allow the commander to "dictate rather than react to battle". (8)

IPB has become a thoroughly accepted doctrinal process at the tactical level. One no longer finds debate in US Army literature about the validity of the process. Current articles focus rather on how to better understand, manipulate, and utilize the process. (9)

The IPB process depends in part on concepts and techniques developed by military geographers from the application of the systemic science of geography. For example, in 1918 the French army had produced maps showing where tanks could pass. Following this precedent in North Africa the Royal



Engineers mapped the friction that varieties of desert terrain offered to wheeled or tracked vehicles over the fighting ground. Called "goings maps", these maps presented the surface differentiated according to the ease of movement. (10) The great armor theorist, J.F.C. Fuller, foresaw one of the future roles of the modern military engineer related to geographic intelligence:

The means whereby the engineer can supply information to the army must remain surveying and map-making... To know where roads, railways and rivers run, where cities, villages, mountains and forests are situated will not be enough... besides them must be added a host of strategical, tactical and administrative 'features'. For example, ground will have to be colored to show where tanks and roadless vehicles can move with ease, can move with difficulty, and can not move at all, so that at a glance a commander is able to see from his map how to best deploy his mechanized arm... The side which possesses the best maps will strategically move quicker, and tactically commit fewer blunders. (11)

Fuller's suggestion is credited for stimulating a German geographer, Erich Sonne, to develop "a new theory of cartography" in 1936. This new theory was subsequently adopted by the Military Geology unit of the U.S. Geological Survey in the development of "terrain appreciation folios", the ancestor of the modern IPB process in the United States Army. (12)

What makes the modern IPB process so useful is that it takes what is known and can be quantified about the physical and cultural environment and super-imposes upon it a visual representation of two inter-active competitors in a time-space relationship. If the process is properly applied, the integration of geographic knowledge and threat knowledge should produce a "snapshot", called a situation template, which represents a possible enemy course of action. The staff intelligence officer is responsible for producing a number of situation templates which depict, in his estimate, a range of the most possible enemy courses of action. The situation templates become the tool by which the commander and staff conduct a wargaming process to evaluate possible friendly course of action. The wargaming process results in the selection of the friendly course of action. Once this course of action has been selected (and perhaps modified) by the commander, the staff then prepares a Decision Support Template and an Event Template which, in the

first case graphically depicts the time-space relationship between the opposing forces and secondly, assists the commander in 1) the allocation of resources, 2) task organizing his force, and 3) assist him in the orchestration of the conduct of operations. (13)

The nature of the type information the process is designed to provide for the commander is the same time-space calculus which has been demanded by military theory and practice. Perhaps IPB is what the theorists would have wanted to train and instill coup d'oeil in their students, if only they had the means to do it at the time when they wrote.

Clausewitz described the theoretical relationship between terrain and warfare as, "a special feature of military activity - possibly the most striking [though not the most important]." (14) Clausewitz was emphatic that terrain must always be considered in association with which he called its' partner, space. "To master it (spatial relationships on terrain) a special gift is needed, which is given the too restricted name of a sense of locality. It is the faculty of quickly and accurately grasping the topography of any area... this is an act of the imagination." (15) In a similar manner, Jomini saw, "the guiding principle in tactical combinations, as those in strategy, to bring the mass of the force at hand against a part of the opposing army and upon that point the possession of which promises the most important results." (16) Jomini's observation clearly suggests a time-space calculus on terrain between inter-active opponents. Jomini did realize the magnitude of this task, "while it is easy to recommend throwing the mass of forces upon the decisive points, the difficulty lies in recognizing those points." (17) Sun Tzu advocated the use of time-space calculations at all levels of war. At what can now be construed as the operational level of war he states, "now those skilled in war must know and when a battle will be fought. They measure the roads and they find the dates." (18) Sun Tzu observed:

Confirmation of the ground is of the greatest assistance in battle. Therefore, to estimate the enemy situation and to calculate distances and the degree of difficulty of the terrain so as to control victory are virtues of the superior general. He who fights with full knowledge of these factors is certain to win; he who does not will surely be defeated. (19)

The science of geography has introduced a number of advantages into the process of analyzing terrain and establishing time-space relationships. Though we sometimes take them for granted, tools such as quality maps and methodologies for categorizing terrain have provided the essential prerequisites for the development of the IPB process. The process allows for an in-depth technical analysis of the military aspects of terrain in a given locality. Sophisticated technology, such as digital mapping, satellite imagery, and computer enhanced graphics, leave almost "nothing to the imagination" in that Clausewitzian sense of understanding topography.

This sophisticated, automated, methodological, modern "sense of locality" provides an understanding about the advantages and disadvantages of a piece of ground. A sense of coup d'oeil makes decisions about the use of that information for military operations in the inter-active environment of combat. So as to keep the relationship between a "sense of locality" and coup d'oeil in perspective, the former is a data collection system, whereas the later is a synthesis which results in a decision. Without a doubt, the better the data and its interpretation, the greater the probability of a correct decision. Clausewitz certainly had this relationship in mind when he noted of the ability to make difficult assessments of spatial relationships, "the man with enough talent and experience to overcome it [the difficulty of spatial relationships] will have a real advantage." (20)

When used properly, the IPB process assists the commander by graphically depicting through the IEP products time-space relationships. These products provide a rational basis for allocating combat resources, task organizing for combat, and conducting operations. To a large degree, geographic sciences were able to assist in providing that advantage, that estimation, which has proven so successful in improving the coup d'oeil of the tactical commander. The question we now turn to is what is demanded of the operational level commander and what can be done to improve his operational coup d'oeil?

### CLASSICAL COUP D'OEIL VS. OPERATIONAL COUP D'OEIL

The porous fluidity and speed of mechanized warfare with radio communications and airborne firepower has extended the scope of a continuous engagement over time and space. Set piece battles are replaced with sprawling conflicts with sporadic fire fights.... The scope of battle has gone far beyond the ken of one man's unaided perception of what was going on over a stretch of country. (1)

To understand how to best support the operational commander one must appreciate the demands of that level of command. The classical theorists understood the concept of coup d'oeil in the context of classical, or Napoleonic, strategy. The premise of the modern theorists is that warfare has evolved from classical strategy to operational art. (2) Therefore, it is appropriate to consider how the requirements for geographic support for the conduct of war have evolved also.

Napoleon is credited with the invention of strategy, an art which he defined as making use of time and space. (3) Clausewitz and Jomini both took the example of Napoleon's concept and practice of strategy as the model for their theories of war. Clausewitz defined strategy as the use of the engagement for the purpose of war. (4) The whole purpose of the engagement was the destruction of enemy forces. "This destruction was not simply contributory to the final objective of the strategist; it was in itself an intrinsic part of that objective." (5) Jomini defined strategy as, "the art of making war on the map... strategy decides where to act." (6) As for Sun Tzu, we find an interesting parallel in that, "time and space factors were nicely calculated... the convergence of several columns upon a selected objective at a predetermined time was a technique that the Chinese had mastered in Sun Tzu's day." (7)

Classical strategy revolved around the Napoleonic concept of the campaign. The campaign was the process by which the commander moved his army, deployed his army, and fought his army in a decisive battle. Generally the war was decided in one campaign by one decisive battle. The campaign defined the purview of strategy. (8) "... all individual engagements were fought out under the personal direction of the commander-in-chief himself." (9)

By the end of the Napoleonic Era, classical strategy began an evolution toward operational art. For example, The Battle of Waterloo, often misconstrued as a decisive battle in the classical sense, can be better and more correctly described as two simultaneous battles on the 16th of June 1815, fought at Quatre Bras and Ligny, followed by a sequence of battles fought on the 18th of June, Waterloo itself, and the battle fought at Wavre on the 20th of June. "The simultaneous and sequential orchestration of these four battles is a rudimentary characteristic of warfare that becomes quite common by the end of the First World War." (10)

The immediate effect of the development of simultaneous and sequential engagements was the addition of depth to the equation of coup d'oeil. Movement to, and deployment about the decisive place and at the decisive time became less fixed around a single point ("an area of topography") and more diffused in both time and space. Napoleon's oath, "Damn you, Blucher!", as the Prussians crashed unexpectedly upon his right flank at Waterloo, most eloquently describes what must have been Napoleon's realization that a significant feature of warfare was changing before his very eyes.

The simultaneous and sequential orchestration of battles became a more pronounced requirement of warfare throughout the 19th Century. Changes in demography and the politicization of whole populations allowed for the formation of mass armies which simply took up more space. Geopolitics played a role as the formation of alliances created the opportunity for multiple fronts. The Industrial Revolution added new technologies; improvements in firepower, mobility, and communications greatly expanded the battlefield well beyond the ability of one commander to see and direct his forces. The American Civil War is usually credited as being the first modern war. The example of Grant's 1864 Virginia Campaign is the first full expression of what is now called "operational art". Annex A provides a detailed comparison of how operational art differs from classical strategy.

Operational art requires a distinguishable level of command. There are various ways to describe this level of command. "The aim of this level of command is to give meaning to tactical actions in the context of some larger design, which itself is ultimately framed by strategy. Put another way, the aim is to get strategically meaningful results through tactics." (11) "The operational level commander disperses his joint forces throughout his operational depth from which he can maneuver to set the conditions for the

tactical battle to achieve the strategic goal" (12) "The operational commander's principle task is to determine and pursue the sequence of actions that will most directly serve the military strategic aim." (13) "In its simplest expression, operational art determines when, where, and for what immediate purpose major forces will fight." (14) In a musical analogy "the operational commander is the composer of a joint and combined symphony, whereas the tactical commander is the conductor who must harmonize combined arms forces according to the composers plan." (15) Annex B provides a visual representation of the relationship between the strategic, operational, and tactical levels of command. Figure 2, below, provides a quick summation of Annex B and highlights in particular, the time-space-distance difference in perspective which separates classical strategy from operational art.

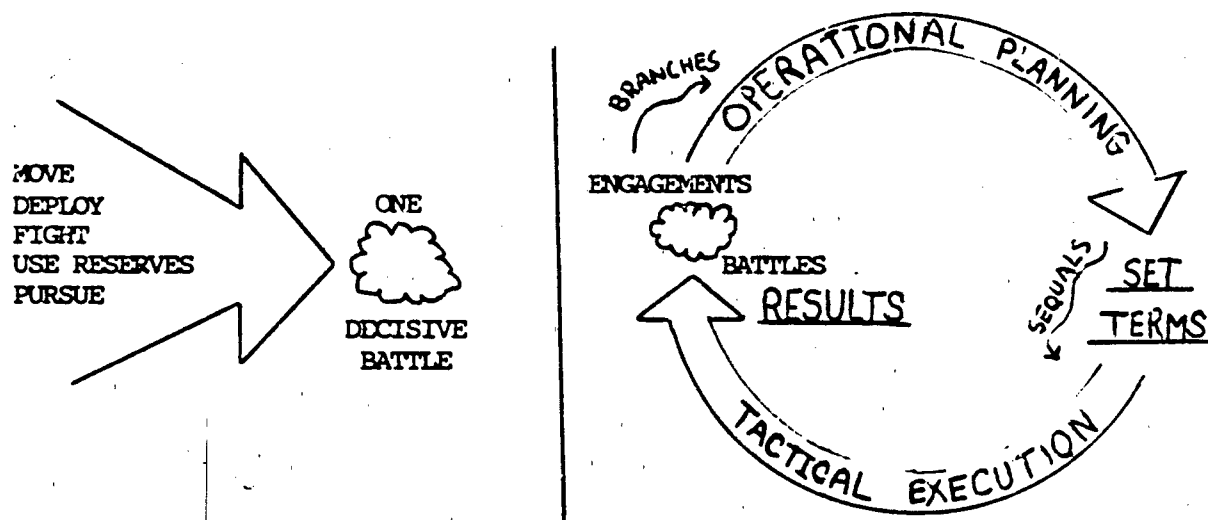
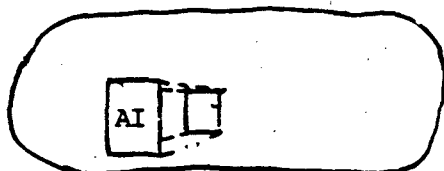


FIGURE 2 (Strategy vs. Operational Art)

A second visual presentation of the time-space and resulting functional responsibility differences between the tactical and operational levels of command is provided below. The purpose of the figure is to highlight differences as they will apply to the use of geography in support of the operational commander. These descriptions also help to identify the nagging difficulty in developing a workable operational level IPB. Tactical considerations of geography are, in many ways, similar to classical strategy. There is a link between classical coup d'oeil and IPB in that both focus on a decisive piece of terrain at a decisive time. A similar

linkage is much more difficult to define at the operational level of war. Time is extended well beyond the current battle, and space is diffused over the entire theater of operations.

### TACTICAL



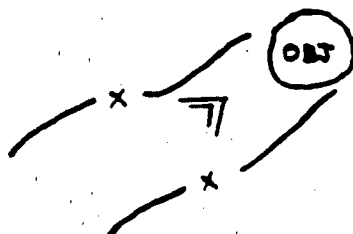
Time-space-mass are compressed and quantifiable by a defined area of interest. (AI)



Maneuver is defined by avenues of approach and constrained by the tactical mobility design of the employed service and forces.

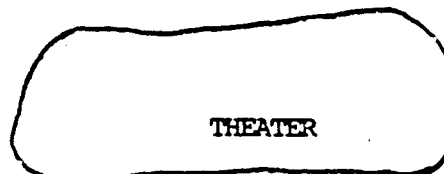


Key terrain commands the landscape along the avenues of approach

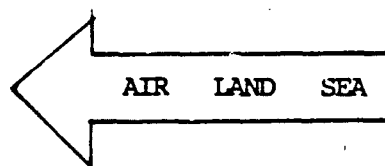


Objectives are the physical object of military action taken. ... a definite tactical feature the seizure of which is essential to the commanders plan. ... defined by a competent authority.

### OPERATIONAL



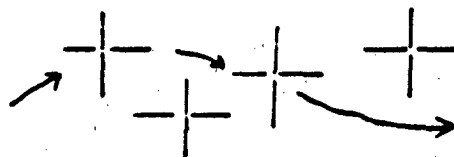
Time-space-mass are diffused over a theater of war or area of theater of operations.



Maneuver is defined by lines of operation. maneuver is enhanced by the operational mobility design of national force structure.



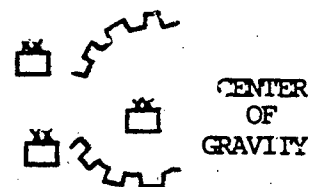
Decisive points determine a marked advantage in either the physical, moral, or cybernetic domains of battle. Decisive points require a decision be made to attack/defend retain/retire.



Objective points are the linkage of decisive points selected by the operational commander across a theater which define the lines of operation.



Center of gravity is the concentration of the fire density of a deployed force... related to time-space-mass since the tactical commander seeks to identify, interdict, and destroy the most lethal and dangerous threats within the enemy concentration (to include C3I and logistics) while seeking to protect his own center of gravity.



Center of gravity is most often defined as the concentration of subordinate maneuver formations (and the operational fires which support them), which equates to potential combat power. Identifying this center of gravity is a function of determining what in the theater is worthy of protection or worthy of attack by his center of gravity.

FIGURE 3 (Geographic distinctions) (16)

Annex B, and the various descriptions of the operational level of command cited above, provide insight into the function of this level of command. The operational level is a coordinating level of command between major, joint, and possibly allied units. This level of command gives direction to tactical forces, and it synergizes resources to provide means for, and mitigate risk to tactical forces. The operational level of command is extended in time and space beyond the current battle, a battle for which the conditions were set by the operational level commander, and the results of which will determine the conduct/execution of future battles in the overall campaign plan.



### THE CURRENT STATE OF US OPERATIONAL COUP D'OEIL

A general should say to himself many times a day: if the hostile army were to make its appearance in front, on my right, or on my left, what should I do? And if he is embarrassed, his arrangements are bad; there is something wrong; he must rectify his mistake. (1)

Napoleon Bonapart

The diffused nature of space and the extension of time, characteristics of the operational level of war, are concepts recognized in US Army doctrinal writing. How to analyze the terrain and geography in which the operational commander operates however, is not well developed at all. At the strategic level of war, the suggested elements of geographic analysis are found in Joint Chiefs of Staff Publication 5-02.1 (Joint Operation Planning System Volume 1 Deliberate Planning Procedures). At the tactical level of war the elements of geographic analysis are described by the traditional mnemonic OCOKA (Observation, Cover and concealment, Obstacles and movement, Key terrain, and Avenues of approach). These elements of geographic analysis provide a ready framework for categorizing the military characteristics of an area of operations. No such framework has been offered for the operational level commander. A framework for analysis is a first step to developing an operational coup d'oeil.

The term "operational coup d'oeil" is not official military terminology. "Operational vision" however, is a term found in our current lexicon. Operational vision has been defined by Mr. James Schneider, theorist at the School of Advanced Military Studies, as "the ability to transform a superior commander's intent into a carefully defined objective and develop a rational plan accordingly." (2) Objectives and rational plans occur in time and space across the "operational canvas of terrain". (3) "The operational idea [vision] achieves its fullest expression when it is 'painted' upon the theater of operations." (4) Successful "vision" therefore, is dependent upon an appreciation of terrain in its relation to military operations, an appreciation which was defined by classical coup d'oeil, and which has application to operational art when depth of time and space are expanded to take into account the distributed free maneuver characteristic of operational art.

The operational level of war lies on the continuum between the strategic level of war and the tactical level of war. "Warfare is really a continuum of functions or activities from the National Command Authorities making policy, national objectives and establishing strategic aims down to the individual soldier." (5) These functions and activities can be organized into hierarchies which describe the level of war at which an activity should occur and how it should be related to the other levels of war for the successful execution of operations. The distinctive features of the three levels of war were described in Annex 1 (Levels of war are Related but Distinctive). Figure 4 below illustrates the continuum between the levels of war. The right side of the figure illustrates the distinctive feature of that level of war as described in TRADOC Pam 11-9, (Blueprint of the Battlefield). The left side of the figure suggests how the distinctive feature of that level of war relates to the application of geography.

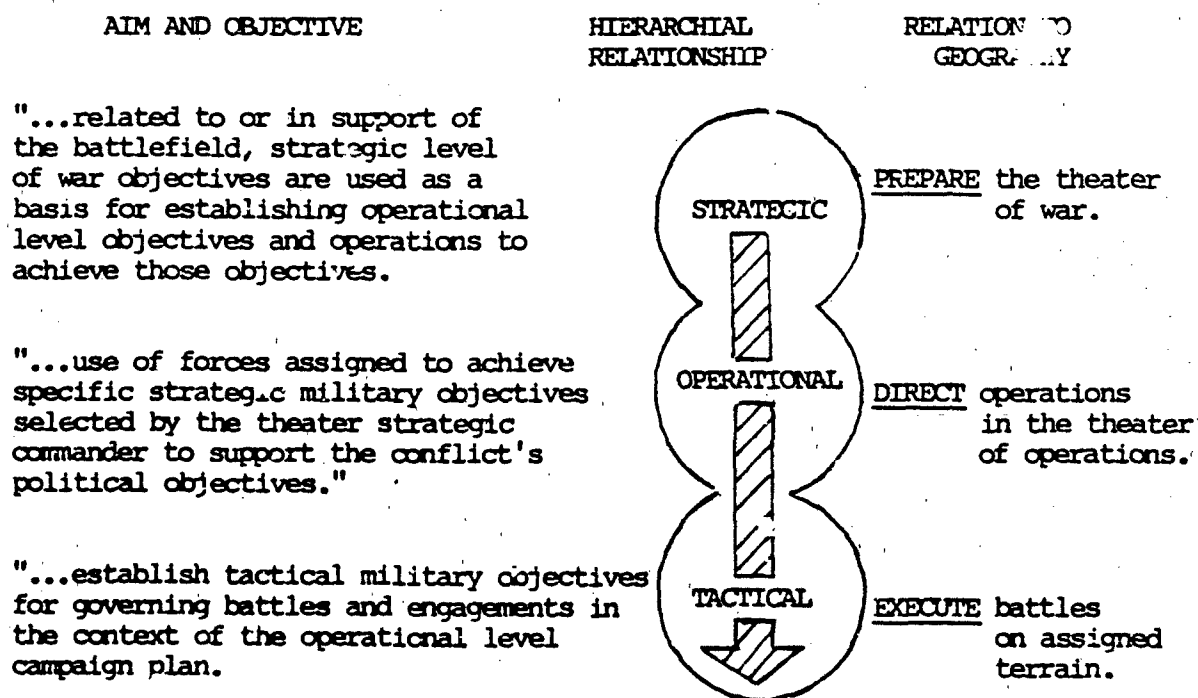


FIGURE 4 (The Continuum of War) (6)

Figure 4 illustrates what can be described in a football analogy as a "hand-off". The military Commander-in-Chief (CINC) prepares the theater

of war and gives to, or hands-off, an objective, a portion of resources, and a geographic area in which to operate to the operational level commander. The operational commander provides direction and synchronization to the joint force which he has received to achieve specific strategic military objectives. The operational commander then gives to, or hands-off, that direction to his tactical commanders. The tactical commanders establish tactical military objectives for governing battles and engagements in the context of the operational level campaign plan.

In the old Cold War paradigm, U.S. Forces generally began the game on the same "playing field" (or were preparing to move to the NATO theater or Korea through REFORGER and "Team Spirit" exercises). The strategic, operational, and tactical commanders occupied overlapping terrain; they were "in theater" together. The paradigm was based on a defense of this commonly occupied terrain.

The old paradigm is no longer valid. The most current draft of the 1991 United States Military Strategy begins with the observation, "Historic changes are sweeping across the international security environment as 40 years of Cold War give way to a dramatically different world." (7) In the old paradigm, military strategy and planning focused on the need to be prepared for a global war, "with the major conflict in western Europe, against a blitzkrieg attack by Warsaw Pact forces." (8) A reflection of the change brought about by these historic changes is captured in the emphasis on increased regional orientation, the new focus for planning.

The most significant departure from the strategic principles that have formed American defense posture over the past four decades is the shift to an increased emphasis on regional threats of potentially serious consequence to US vital interests. (9)

The predominate basis for US conventional force requirements in the future is that of regional crisis response and forward presence. Inherent in this requirement are four fundamental considerations:

Power Projection: of forces from either our shores or forward deployed locations, with the capability of conducting forcible entry operations, if necessary and massing overwhelming force.

Forward Presence forces with "Strategic Agility" to respond

rapidly and effectively not only in the region where deployed but in other regions as well, as demonstrated by Desert Storm.

Alliance and coalition building will play an increasingly important role as the size of our forces are reduced at home and abroad. Responding to a regional crisis as a part of a "community of nations" will have a continued positive synergistic effect on emerging New World Order. (sic)

Timely response and measured response options provide the NCA with a wide menu of options for the use of US military resources to either deter or defeat threats to US and allied interests. (10)

The change in paradigm is not subtle. It does have important implications, not the least of which affects the importance of Intelligence Preparation of the Battlefield at the operational level. In contrast to the old paradigm, commanders of the distinct levels of war will not necessarily occupy comfortably overlapping and familiar terrain with a shared defensive orientation in the pre-hostility environment. Regional crisis response suggests offensive action, or at the very least, an offensive strategic movement to the crisis area in order to establish an operational or tactical defense in a hostile environment.

A second changing feature of the new international security environment is that of the structure for strategic level command of US military forces. The outline for strategic military command of US Forces resides in the Unified Command Plan (UCP). The proposed restructuring of the CINC areas of responsibility was addressed by The Chairman of the Joint Chiefs of Staff, General Colin Powell in January, 1991. His assessment of a reduction in the number of "warfighting CINCs" to four is evidenced in the draft 1991 United States Military Strategy. The suggested organization of the nation's armed forces is:

1. Strategic Forces. (Nuclear Triad forces)
2. Atlantic Forces. (Europe, the Mediterranean, the Middle East, and Southwest Asia.)
3. Pacific Forces. (the Pacific Region including South east Asia and the Indian Ocean.)
4. Contingency Forces. (designated Army, Navy, Marine Air Force, and Special Operations Forces tailored for the "come-as-you-are" arena of spontaneous, often

unpredictable crises.) (11)

The effect of this new paradigm is to highlight the operational level of command by setting it off distinctly from the strategic level of command and the tactical level of command. The historical precedent of Lebanon 1958, The Dominican Republic Intervention 1964, the Vietnam Advisory years 1961-65, and Grenada 1983, suggest that the CINC becomes "almost irrelevant" in the daily conduct of operations once the crisis begins". (12) The highly visible role of General Maxwell Thurman in Panama 1989, and the personal command of General Norman Schwarzkopf of "Operation Desert Storm", are deviations from the historical norm. That both Southern Command and Central Command are not included in suggestions for the new Unified Command Plan further suggests that the new, fewer CINC structure anticipates that CINC responsibility will gravitate toward that of an adjunct strategic military advisor to the National Command Authority. Monitoring US interests and preparation for possible military intervention will be the primary activity.

The football analogy of a hand-off becomes more complex in the new paradigm. The CINC, who with his staff has regional expertise, establishes strategic military objectives for execution by an operational level commander. The operational level commander and his staff may or may not be regional experts. Even if the designated operational commander has time during crisis development to become familiar with the crisis area, tactical commanders may not. As has often been the historical case, the tactical commanders may not even know the destination of their deployment until just prior to or enroute to the objective area. (13)

As a strategic military adjunct for the National Command Authority, CINCs provide military input to the strategic planning cycle. They are provided a methodology and resources for preparing their theaters of war.

CINCs are responsible for developing plans of military action, with a regional perspective, and under peacetime conditions. CINCs emphasize the strategic deployment of apportioned forces, equipment, and supplies based on their concept of operations. Their plans are based on predicted conditions that will be countered with resources available during the planning cycle. (14)

The officer selected as the CINC is generally considered an expert in the cultural, political, and military issues of his geographical area of

responsibility. "Beginning with those US national interests that pertain to his theater, each individual CINC (sic) draws upon regional assessments in formulation his strategy." (15) Most unified combatant commanders with a geographic area of responsibility have a Political Advisor (POLAD) as a member of their personal staffs. The POLAD is a representative from the Department of State experienced in the political and diplomatic situation in the theater. (16) The CINC, supported by his personal and coordinating staff, is predisposed (and expected) to achieve regional expertise in his assigned area of responsibility. He is, to borrow Napoleon's phrase, responsible "to say to himself many times a day, "if the hostile army were to make its appearance... what should I do?..."

The plans which CINCs develop are based on strategic requirements assigned by the National Command Authority. These requirements are transmitted by Joint Pub 0-2, Unified Action Armed Forces, (UNAAF), by the Joint Strategic Capabilities Plan, (JSCP), or on occasion by the direction of the Chairman, Joint Chiefs of Staff. Additionally, the CINC may determine that a need exists to prepare OPLANS to cover contingencies not assigned by the JSCP. (17) It is within the planning process for these strategic plans that a further refinement of the geography within the theater of war, as it applies to the specific military action being planned, is conducted.

The Joint methodology for planning involves a staff estimate and a commander's estimate. Since the focus in this monograph is to concentrate on the terrain analysis and geography, I will examine those characteristics of terrain and geography which are identified as important in Joint doctrine at the strategic level for the staff and commander.

The descriptive data of the terrain and geography is provided by the J2 in the Intelligence Estimate. Appendix C (Intelligence Estimate) of JCS Pub 5-02.1 (Joint Operation Planning System Volume 1 Deliberate Planning) provides a suggested outline of factors to be considered in describing the Characteristics of the Area of Operations. This suggested theater of war evaluation begins the process of evaluation in the Evaluation-Analysis cycle of the intelligence process. These include:

- 1) Topography: This describes relief and drainage, vegetation, surface materials, cultural features, and other characteristics in terms of their effect on key terrain, observation, fields of fire, obstacles cover

and concealment, avenues of approach, lines of communication, and landing areas and zones

2) Hydrography: Here is described the nature of the coastline; adjacent islands; location, extent and capacity of landing beaches and there approaches and exits; nature of the offshore approaches, including type of bottom and gradients; natural obstacles; surf, tide, and current conditions.

3) Climate and Weather: This is a descriptive summary of temperature, cloud cover, visibility, precipitation, light data, and other climate and weather conditions and their general effects of roads, rivers, soil trafficability, and observation.

4) Transportation: Here are described roads, railways, inland waterways, airfields, and other physical characteristics of the transportation system; capabilities of the transportation system in terms of rolling stock, barge capacities, and terminal facilities; and other pertinent data.

5) Telecommunications: Telecommunications facilities and capabilities in the area described.

6) Politics: This describes the organization and operation of the civil government in the area of operations.

7) Economics: This is a description of industry, public works and utilities, finance, banking, currency, commerce, agriculture, trades and professions, labor force, and other related factors.

8) Sociology: Here are described language, religion, social institutions and attitudes, minority groups, population distribution, health and sanitation, and other related factors.

9) Science and technology: The level of science and technology in the area of operations described here

This construct of key elements of terrain and the broader descriptive elements of geography, at the strategic level, provides a useful framework for organizing geographic information into usable military categories. The information is appropriate to the level of command and it is useful for the conduct of operational art practiced at the strategic level of war. The J2, even though he is most likely not a professional geographer by training or disposition, is cued to focus the efforts of his staff of experts. These elements enable the CINC to evaluate the effect of geography in his theater of war against the military pursuit of national policy and strategy. "It should likewise help him to distinguish the attainable from the illusory."

(18)

The geographic input in the CINC's estimate provides information useful

both in the short-term and in the long-term. In the short-term, his theater analysis identifies physical constraints to the exercise of military options. Logistics planning, suitability of equipment for the environment, special combat support and combat service support capabilities required, and specialized training are examples of the needs his analysis might reveal. In the long-term, the need for advanced operating bases, for transit facilities and support to friendly troops crossing his theater, and the military implications of alliances should be considered.

At the other end of the spectrum, in the tactical realm, the key elements of terrain analysis are summarized in the traditional mnemonic, OODKA: Observation and fields of fire, Cover and concealment, Obstacles and movement, Key terrain and Avenues of approach.

To date, no such construct for the organization of geographic information and terrain analysis at the operational level of war has been suggested. FM 34-130 (Intelligence Preparation of the Battlefield) contains an annex which addresses "the operational level of war". Unfortunately, the guidance contained refers to the strategic theater of war level. It mimics the construct contained in JCS Pub 5-02.1 (Deliberate Planning Procedures). FM 34-130 is in fact, the source of frustration witnessed during operational planning exercises conducted at the School of Advanced Military Studies in Academic Year 1990-1991.

Campaign Planning, the study conducted by the Strategic Studies Institute of the US Army War College, suggests that at the operational level, the commander seeks the neutralization or destruction of the concrete center of gravity (the main enemy force). The study stops short of suggesting how to identify the geographic intelligence support required to identify and close with that concrete center of gravity. FM 100-6 (Large Unit Operations) provides an example campaign plan, a copy of which is provided as Annex 3 to this monograph. Reference to the theoretical concepts of "center of gravity" and "culminating point" is made in paragraph 1 (a). One is referred to the intelligence annex for more detailed information "to include a discussion of geography and weather." There is no format for the campaign "intelligence annex". The reader is therefore left to assume he must apply the strategic elements of terrain analysis, or perhaps the elements of tactical terrain analysis?

The current state of "operational level coup d'oeil" is a distinct lack



of framework and structure to analyze quickly, accurately, and appropriately the key elements of terrain in the theater of operations. However valid the theoretical terms necessary for the conduct of operational art at the operational level of war may be, one can not arrive at identification of those geographic realities without an appropriate geographic component in the overall intelligence process. "When (operational) concepts must be produced in a tense and compressed time frame, the analytical process assumes enormous importance. A process allows the commander and the analyst to separate the wheat from the chaff and isolate the golden grains of essential information from an endless stream of raw information." (20) Figure 5 illustrates the lack of connection between the analysis conducted at strategic level of war and at the tactical level of war. In our doctrinal writing we have failed to identify the key and usable categories of terrain analysis appropriate to the operational level of war.

<u>STRATEGIC</u>	<u>OPERATIONAL</u>	<u>TACTICAL</u>
Topography		Observation
Hydrography		Cover and concealment
Climate and weather		Obstacles and movement
Transportation	CENTER OF GRAVITY?	Key Terrain
Telecommunications	CULMINATING POINTS?	Avenues of Approach
Politics		
Economics		
Sociology		
Science and technology		

FIGURE 4 (The Missing Key Elements of Operational Terrain Analysis)

## SUGGESTED KEY ELEMENTS OF OPERATIONAL

### COUP D'OEIL

Differences in scale of problems, and corresponding differences in method of analysis, the kind of solutions sought, and the scope of considerations make it desirable to recognize strategic [operational] geography within a somewhat distinct set of premises. The larger the area under consideration and the longer the time period involved, the more extensive does the list of pertinent geographical factors become. (1)

The mere collection of geographic data has no military value. (2) Professional geographers seek "a distinct set of premises". Military theorists seek a commander who can separate the wheat from the chaff with "effortless coup d'oeil". The operational artist seeks an analyst who can assist him in the construct of his operational design. Operational design, which serves as the basis for our criteria, allows the commander to envision where his forces must go to achieve the established end-state, how to sequence events across time and space, and how to resource his forces across that time and space. The staff of the operational level commander is tasked to provide its assessment quickly, accurately, and appropriately.

The new international security environment presents us with a challenge to execute a national strategy, based on deterrence and crisis response, through power projection which is critically dependent on timely action.

(3) Putting together and sustaining the "force package" is a strategic military responsibility. "With a vast array of interests in his area, it seems unlikely that the theater CINC will put on his steel pot and 'fight' the war himself... he will organize his theater with subordinate joint force commanders in theaters of operation to employ U.S. forces against the enemy."

(4) Commanding the "force package", in all likelihood, will be an operational level of command responsibility.

To react quickly means to avoid unnecessary duplication of effort. The regional expertise at the CINC level for analysis of the terrain and geography need not be duplicated by the operational staff officer. To react accurately is to provide precise quantitative estimates. It is the responsibility of the J2/G2 to establish priorities and focus the efforts

of the expert cartographers, meteorologists, and analysts who provide terrain intelligence products. To react appropriately is to not lose "the operational bubble". The vision of the operational level intelligence officer, like that of his commander, must extend into time and space beyond the current battle.

The elements of geographic analysis at the strategic level are appropriate for the formulation and execution of strategic military policy. They are however, insufficient for the execution of military operations: they are too broad and general. The elements of terrain analysis at the tactical level are appropriate for the conduct of battles and engagements. They are however, woefully insufficient for the design of campaigns and major operations; they are too specific and limited in time and space. What is required at the operational level of war is a level of analysis which is neither too big nor too small. Specifically, this level of analysis must support the construct of operational design. Suggested key elements of this level of analysis are offered below.

Accessibility is the first key element of the operational commander's concerns. Accessibility defines the options for physical entry into the crisis region. Accessibility may be as simple as an invitation by a host government. It may, on the other hand, require forced entry. Airfields, ports, coastlines, and landing zones are the type of features through which access can be made. Evaluations of accessibility continue throughout the conflict. The operational artist also conceives of access in terms of physical approach to the enemy center of gravity. As such, access into the crisis region to a physical contact and dominance of the center of gravity helps define the theoretical notion of a line of operation. Accessibility is not limited to combat forces. Logistics, sustainment, psychological warfare, and Civic Action access must be considered also.

Mobility is a function of the terrain and the characteristics of a type unit. Transportation networks, climate, obstacles, petroleum products requirements, distance from the point of access to objective, are examples of physical characteristics of terrain relating to mobility. Mechanized, light infantry, airborne/airmobile, and special operating forces are types

of units with unique mobility characteristics.

Visibility is a consideration which has special applicability in modern operational art. Horizontal and vertical range of vision is not adequate to describe visibility considerations at the operational level of war. Visibility refers to the effects of weather and terrain in the theater of operations on the electronic sensors, target acquisition systems, and intelligence gathering equipment dependent on the electromagnetic spectrum.

Communicability is an evaluation of the effects of terrain and weather on the communications systems necessary for effective command, control, and integration of joint (and combined) forces. The range of weather and terrain phenomena which could effect this critical function extends from magnetic deviations close to the surface of the earth to fluctuations in the ionosphere.

Availability is a consideration of what is pre-positioned in the theater (Pre-positioned war reserve material stocks, [PWRMS] and Mobile Pre-positioned Shipping [MPS]) as well as what can be brought to bear in the theater of operations. Availability addresses the ratio between combat forces and logistics units required for their support. Availability includes host nation support and third party support to the combat force. A particular concern for the operational commander in modern crisis response is the availability of post-hostility support. Civil Affairs support and refugee relief have become increasingly important to "winning the peace" during, and after crisis intervention.

Vulnerability is an analysis of the opponent's capability to interdict access, lodgment, lines of operation, lines of support, and lines of communication. Vulnerability at the operational level of war is more than just force protection. It includes the protection of freedom of action for future operations. (5)

These suggested key elements of operational terrain analysis support the commander as he attempts to envision how he will design his campaign. These elements take him through entry into the crisis region to his final

dominance over the enemy center of gravity. These elements allow him to evaluate how to sequence operational and logistic events over time and space. These elements lay the ground work for the type of spatial understanding of the inter-action of opposing forces on terrain which could be called operational coup d'oeil.

Figure 5 illustrates how the key elements of operational terrain analysis support the construct of operational design. Such a construct provides the operational level commander a rational method for evaluating "the operational canvas of terrain". The construct is not an end, it is a starting point. Appreciation of the operational terrain is cycled into the contemporary intelligence process. Geographic intelligence is then integrated with intelligence about enemy intentions, enemy capabilities, and enemy vulnerabilities. An appropriate level of terrain analysis, one that is neither too big nor too small, is the first essential key to maximizing the worth of the intelligence process to the operational commander.

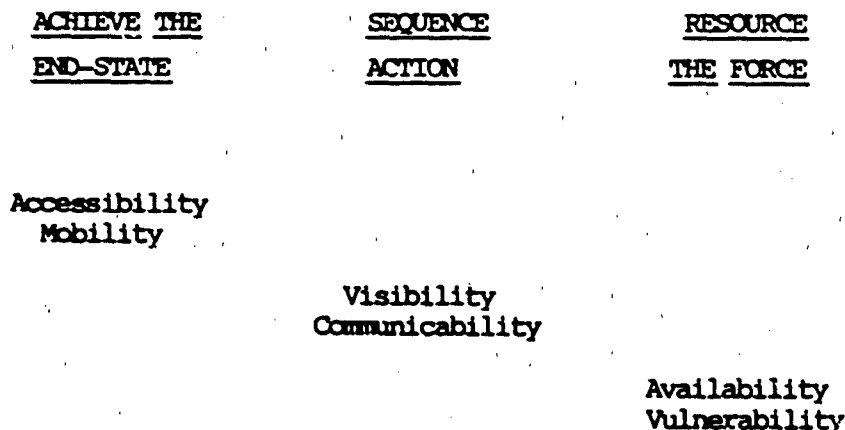


FIGURE FIVE  
(Key Elements of Operational Terrain Analysis Support Operational Design)

OPERATIONAL COUP D'OUIL IN "OPERATION NEPTUNE"

To sum it all up in military parlance, we found ourselves for purposes of our operation in that desirable attitude known as 'on interior lines', with the German defenses of northwest Europe nicely draped most the way round us. This gave us a clue for which we were looking.... (1)

Lieutenant General Sir Frederick Morgan

Having identified the key elements of operational level of war terrain analysis, the next step in this study will be to consider these elements within the context of a historical case study of a modern campaign. The case study of "Operation Neptune, the Allied invasion of Europe in 1944, provides an opportunity to examine geography and coup d'oeil at the operational level of war. The planning and preparation for "Neptune" were heavily dependent on the skills of geographers and the science of geography.

Despite the stunning success of securing the beachhead, a stalemate occurred as soon as the Allies attempted to break out of the beachhead. This case study offers a contrast between brilliant success and near disaster. The use of geography appears to be one of the most important factors in achieving the successful beachhead. The near nonexistent appreciation of geography appears to have been the cause of a near operational failure. This case study suggests that an organized application of the geographical information which was available to the operational commander and staff, something along the lines of the key elements of operational level terrain analysis, could have made a significant contribution towards avoiding the stalemate. Within the context of the operational design parallel serving as our criteria, application of operational level terrain analysis would have provided that insight about the inter-relationship of opposing forces on terrain which we call coup d'oeil.

The Combined Chiefs of Staff established a planning agency for the detailed development of "Operation Neptune" in January of 1943. Chief of Staff to the Supreme Allied Commander (COSSAC) was the name given this organization. British Lieutenant General Sir Frederick Morgan was designated as the Chief of Staff, but no Supreme Allied Commander was designated. COSSAC was therefore, a planning agency without a commander until the appointment of General Eisenhower as Supreme Allied Commander in January

of 1944. At that time, COSSAC was amalgamated into the Supreme Headquarters Allied Expeditionary Force (SHAEF).

We will begin this examination of terrain analysis in support of the Normandy invasion with a geographic footnote. General Morgan relates that the map was his most important tool. Consulting a variety of maps as he began his immense task, he recalled;

...the somewhat startling deduction that, of all the fifth columnists who ever worked against us, the greatest must surely be the late Mercator, whose handiwork adorns probably every school atlas ever published.... We turned back to our maps of northwest Europe and, of course, found that they were as ill adapted to our purpose as could well be imagined. One could go further and say that the information they gave us was altogether misleading.... We had got the whole thing upside down. (2)

Annex D shows the coast of Europe "upside down". The observation of "interior lines" presented by this projection became the basis for "Neptune" planning. The supporting feints and deceptions derived in support of "Neptune" were developed out of this same projection. Armed with a unique perception of the theater, COSSAC next began the task of gathering geographic information.

COSSAC received its geographic support from four sources. The first was from a compilation of on-going intelligence in support of commando raids and the strategic air war. Tasked to "give cohesion and impetus" for the invasion planning, tapping existing sources of information was time efficient. A second source of support came through liaison between the COSSAC G3 (Operations) and the geographical support section of the Imperial General Staff. Providing the proper maps for planning and operations was no small task when one considers the number of maps required to support the invasion force. The operations security requirement to keep map production at so grand a scale a secret from the curious and German intelligence was equally challenging. Lieutenant General Morgan wrote, "...the campaign of 1944-45 was the only one for which I had set out with the proper outfit of the right maps, on an intelligible scale, and of impeccable accuracy.. I doubt if any army has ever gone to war before so perfectly equipped with maps." (3) The third source of geographic support was provided by "the Baker Street

Irregulars" of the Special Operations Executive (SOE). The SOE provided the collating of photographic intelligence, coordinating with the French Resistance for required information, and dispatching landing parties to the French Coast to take geological samples of the European coast when required. (4) The final category of geographic support came from a grouping of Royal Air Force and US Army Corps of Engineer specialists who produced terrain models. When the decision to go for landing on the Normandy beaches was finally made, six terrain models of selected landing sites were constructed to support planners, leaders, and soldiers. By combining aerial photos with a Swiss process called "stereocomparograph", the model makers were able to show detail down to the width and gradient of the invasion beaches as they would appear on D-Day at a scale of 1:5,000. (5)

Armed with an arsenal of geographic intelligence support, COSSAC began its work. "What was wanted was a lodgment area into which we could blast ourselves and from which our main bodies, having suitably concentrated themselves within it, could erupt to develop the campaign eastward." (6) "Neptune" could not be considered in isolation from the theater campaign plan. "It wasn't just the beaches we were looking for...the landing beaches were just one x in an algebraic expression that contained half the alphabet." (7)

At the strategic level, geographic considerations of the adequacy of an invasion coast led to a final consideration of two possible sites. The area of the Pas des Calais and Normandy Peninsula both provided the requisite combination of sub-shore composition and tidal range spread to support the operations of landing craft and flat bottomed boats. The low lying and sandy coasts with a gradual rise inland provided excellent conditions for cross shore movement of heavy vehicles and supply inland. (8) The strategic level debate leading to the final selection of an invasion site revolved around three key geographic criteria.

The first strategic criteria was the capability of airpower to support the invasion. The relatively short distance between the English airfields and the Pas des Calais was an advantage. The Pas des Calais however, lay along the route of allied strategic bombers. By templating the relatively short range of Luftwaffe fighters against the known locations of their operating airfields, what became apparent was that a Normandy approach would force the Luftwaffe to make an uncomfortable choice between bomber



interdiction or invasion interdiction. Planners determined that the Normandy site would put the Luftwaffe at a greater disadvantage than the manageable disadvantage of extra distance/less loiter time required of allied tactical air support.

The second strategic consideration was that of the early capture of a port facility to support the build up of the main body forces. It was assumed that the minor ports of the Pas des Calais would be contested, if for no other reason their close proximity to the invasion area. In such a condition they would have been left after the invasion battle they would have constituted the very poorest of bases from which to develop a major land campaign. (9) A turning movement to the north to capture the major ports of Rotterdam/Amsterdam, or a move south to capture La Harve, would have required turning a flank to the enemy defense and the crossing of several major obstacles.

The third strategic consideration was that of defense of the lodgment area. "Overlord" required a sequential build up of 30 divisions in the advanced guard, followed by 100 divisions in the main body. Logistics forecasting indicated a sustainment effort of 12,000 tons of supplies and 3,000 vehicles per day just to support the advanced guard. (10) Such a logistics effort required a secure base. Pas des Calais offered no lodgment area which could be defined by defensible terrain. Additionally, the Paris-La Harve transportation network would have provided an exceptional opportunity for the Nazis to reinforce rapidly against an invasion attempt at Pas des Calais. Normandy, however, was separated from the major French transportation network by the Seine River. By cutting the 14 major bridges over the Seine, it would be possible to isolate the Normandy invasion area from German theater reserves during the critical build-up period.

Based solely on geographic factors, Normandy was the obvious choice. "Once all the elements of the decision had been weighed, the Bay of Seine from the southwest coast of the Cotentin to Caen seemed so obviously the right place to land that no doubts ever developed..." (11)

Given a strategic arrow to follow, the next step was that of the operational level commanders. The operational command of the land forces for "Operation Neptune" resided with the 21st Army Group, under the command of General Bernard Law Montgomery. General Montgomery's intention after the initial beachheads were secured was to hold in the area south and east

of Caen while the First U.S. Army meantime maneuvered to cut off the Contentin peninsula and capture Cherbourg. (12).

The geography of the lodgment area is shown in Annex E. Located on the tip of the Cotentin Peninsula lies the key port of Cherbourg. South of Cherbourg lies the Carentan Marshes, an area reinforced as an obstacle by the deliberate flooding of the Douve and Merdert Rivers. To the east of the invasion beaches lay the town of Caen. Caen dominated the road network controlling the invasion beaches. Caen opened into a plain (the Campagne de Caen), which is characterized by rolling, armor favorable terrain leading into the strategically important Seine River-Paris Basin. South of the invasion beaches lies the infamous "bocage" country for which Normandy will always be remembered. The bocage lies on the northern slopes of the Collines de Normandie, a hill mass rising from sea level to an elevation 200 meters thirty miles inland.

The operational commander sought to take advantage of the geography of the area. In the east, II British Corps was assigned the initial role of defense of the beachhead from an armored assault likely to originate out of Caen. Such a counterattack by the Nazis would have had the potential of rolling up the flank of the invasion force from east to west. In the center lay the bocage. The majority of the 82d Airborne was dropped into this area to disrupt any German attempt to repel the Omaha landings. The combined effect of the 82d's landing and the overall surprise achieved on 6 June allowed the V (US) Corps to move rapidly to secure Caumont, 20 miles inland. V (US) Corps was deliberately halted at Caumont until D+45 "by a decision of the higher command in view of overall tactical considerations." (13) In the Utah sector, the 101st Airborne was dropped in order to secure the beach exits in the vicinity of Carentan and crossings across the Carentan marsh area. "This protected the south (flank) and with the Utah beach exits secured, the VII (US) Corps was able to turn north into firmer and higher ground toward Cherbourg." (14)

There is little question that "Neptune" was a stunning military victory. The geographic component of the intelligence process greatly influenced the strategic and operational commander's decisions. Their coup d'oeil, in a sense, seemed to lead to the obvious conclusion favoring Normandy. "The wonder was that the enemy was to prove incapable of perceiving its obviousness - a failure abetted by Allied schemes of deception, but still

a wonder. (15).

Though "Neptune was a stunning military success, the ensuing Battle of Normandy and breakout from the beachhead which followed were quite a different matter. Following the successful lodgment was a, "costly deadlock of seven weeks' duration, disturbingly reminiscent of the Western Front of World War I." (16) The bocage and inundated terrain in the west enhanced German defense while at the same time reducing the American strong suit of mobility. Entire U.S. divisions were reduced to a front of not much more than one tank in width by the very same terrain which had protected the southern flank of their drive north on Cherbourg. In the east, the additional strength accrued to the Panzer divisions by the nucleated villages and bocage around the town of Caen stymied Montgomery's hopes for a II British Corps breakout into the Campagne des Caen toward Falaise. Historians have suggested the dramatic reversal in the fortunes of the Allied forces was due to a lack of effective operational planning to cope with the Norman geography. (17) The COSSAC/SHAEF planners certainly seemed to be aware of the defensive potential of the bocage. Lieutenant General Morgan surmised, "It seemed to us that the side which could first occupy the bocage with sufficient strength would score a most decided advantage." (18) The debate surrounding General Montgomery's pre-invasion boast to secure rapidly Caen and exploit toward Falaise indicates that General Montgomery, despite warnings from COSSAC/SHAEF, formulated no operational appreciation for the potentials of the bocage. If General Montgomery failed to see the battlefield in depth and did pay little attention to the potential disasters awaiting in the bocage, he was in good company.

As early as 8 June General Bradley called the bocage the 'damndest country I've seen.' General Collins of VII (US) Corps was equally surprised by the nature of the hedgerow terrain and told General Bradley on 9 June the the bocage was as bad as anything he had encountered on Guadalcanal. Brigadier General James M. Gavin ... said, 'Although there had been some talk in the UK before D-Day about the hedgerows, none of us really appreciated how difficult they would turn out to be. (19)

The allegation of a lack of effective operational planning seems valid. By fixing their gaze upon the amphibious assault, even as critical as that

event was, the operational planners of 21st Army Group failed to see the post-invasion battle in depth. Conditions for the breakout were not what they could have been. With the Germans firmly in control of the bocage and the inundated marshes, the conditions for a defense were as favorable as the terrain of all of northern France would allow for them between the Peninsula to the Vosage Mountains near Metz.

The failure of operational design stemmed from a failure to analyze the terrain to a depth beyond the lodgment. "What can I do with the terrain, what can he do with the terrain, and how will we interact on the terrain", are the tried and true questions stemming from the classical application of coup d'oeil. By becoming intimately involved with tactically important minutiae regarding the assault, 21st Army Group operational planners and commanders lost the "operational bubble". The suggested elements of operational terrain analysis would have cued them to get beyond the "current battle". Access, in the context of Norman terrain, required control of the bocage. Mobility in the bocage, as it was learned at a terrible price, could be enhanced by a combination of modifications to existing equipment (such as the "rhino hedge cutter" attachment to the M4 tank) and a closer combined arms team cooperation. An early appreciation of the defensive strength of the bocage should have led operational level leaders to require training and equipment modifications in anticipation of a potential stalemate. Vulnerability in the bocage was exasperated by halting V (US) Corps at Carentan, thereby allowing the Germans three weeks to reinforce the southern marshes from La Haye-du-Puits to St. Lo.

A great deal of strategic brilliance was evidenced in the selection of the "Neptune" beaches and lodgment area. The flexibility and adaptability of tactical units to the conditions they encountered in the bocage remains legendary. The missing chapter in the "Neptune" story is the operational level of command. The failure to link tactics to strategy by way of a refined and coherent appreciation of the geography of Normandy at the operational level may well have prolonged World War II unnecessarily. (20)

### CONCLUSION

If there is a summing up to be made, I think it must be whereas anyone can make a plan, it takes something quite out of the ordinary to carry it out. The more scientific warfare becomes, the more scientific must be its planning and preparation, but victory belongs not to those who forge the weapon, but to him who is gifted with the artistry to wield it. (1)

United States Army doctrine makes clear that understanding the limitations and opportunities of terrain is a fundamental military skill. From our earliest days on active duty we recall how prized was the lieutenant or junior officer who could read a map well! We recall too, those who could not. Derisive humor and ridicule were heaped on the "misoriented" junior officer. A more serious level of concern about basic professional competence was in store for the captain or field grade officer who had not mastered the map.

Terrain appreciation goes well beyond simple navigation skills. It gets to the very center of the military trade. Commanders must understand the operational and tactical implications of the physical environment as well as its effects on their soldiers, equipment, and weapons. More importantly, they must understand these effects in the inter-active environment of combat. Terrain analysis varies among levels of command ranging from identification of dead-space at the squad leader level to understanding the effects of transportation networks at the strategic level.

The theoretical basis for terrain analysis is the concept of coup d'oeil. The nature of coup d'oeil was identified to be a quality of the intellect which enables the commander to appraise the enemy, to appraise the advantages and disadvantages of a piece of terrain, and to visualize the time-space relationships between opposing forces. The Intelligence Preparation of the Battlefield process is a practical manifestation of the theoretical concept. The science of geography provides a sophisticated, automated, methodological, modern sense of locality which, when applied to the construct of the contemporary intelligence process, can assist in improving the commander's understanding of the spatial relationships which can be developed in a given tactical operating environment.

Frustration has been experienced trying to apply the IBP process directly on the operational level of war. This frustration can be explained by a

failure to understand the distributive maneuver characteristics of operational art as distinct from classical strategy and by a failure to understand the command functions of the operational level of war. Once these distinctions are made clear, it is easier to grasp what about the terrain is important to the operational level of war commander.

What has been suggested in this monograph is a construct for analyzing the key elements of operational terrain. These key elements were identified as Access, Mobility, Visibility, Communicability, Availability, and Vulnerability. These key elements satisfy the criteria of the operational design by assisting the operational commander to identify where his forces must go to achieve the established end-state, how to sequence events to reach that end-state, and how to resource the force that will be required to achieve the desired end-state. Identifying these key elements of operational terrain works back into the contemporary intelligence process where relevant geographic information is integrated with equally relevant operational intelligence information in a cycle of Evaluation-Analysis-Evaluation. Such a construct gets us closer to improving the coup d'oeil of the operational level of war commander.

As significant as an improvement in understanding what the operational commander needs to know about the terrain might be to the operational level IPB process, it is not all that needs to be said about operational level coup d'oeil. A part of modern day operational level coup d'oeil is knowing enough about the science of geography to know what to demand of and request of geographers and terrain analysis teams. Officers of all branches serving at the operational level staff must be able to direct the efforts of geographers in producing needed products and gathering relevant information.

In the final analysis, coup d'oeil is a practiced and learned skill. It can not be learned in a book: it can not be bought in a can. It comes from knowing what gives personality to a place. It comes from a singular fondness of the earth, as had General Sherman. The Operational level of war is conducted over huge expanses of terrain and in extended time. This extension in time and space may be a new characteristic of the old drama of warfare, but a truism which is likely to remain for a long time to come is that the commander who better understands all that the geography of the battle area implies, 's the commander most likely to win.

ANNEX A: Classical Strategy and the Operational Art.

"The Theory of Operational Art, Theoretical Paper No. 3. p. 14

CLASSICAL STRATEGY

1. Maneuver to contact.
2. Armies collide in decisive battle.
3. Logistics is a consideration only in the initial phases of campaign.
4. Vigorous pursuit after battle.
5. Campaign ends.
6. Generally war is also terminated.
7. The commander sees the entire battlefield.

OPERATIONAL ART

1. Battles and engagements begin immediately at the national borders
2. Several armies fight indecisive battles.
3. The only decisive battle is the last battle of the war.
4. Logistics considerations impose pauses upon operations often before a pursuit can be decisive.
5. Wars consist of several campaigns; campaigns consist of several distinct operations; Operations consist of several distinct battles and maneuvers.
6. Operational Art is strategy with the added dimension of depth.
7. The commander sees very little of the many simultaneous battles occurring.

ANNEX B: The Levels of War Are Related but distinct  
TRADOC Pam #1-9, p. 11.

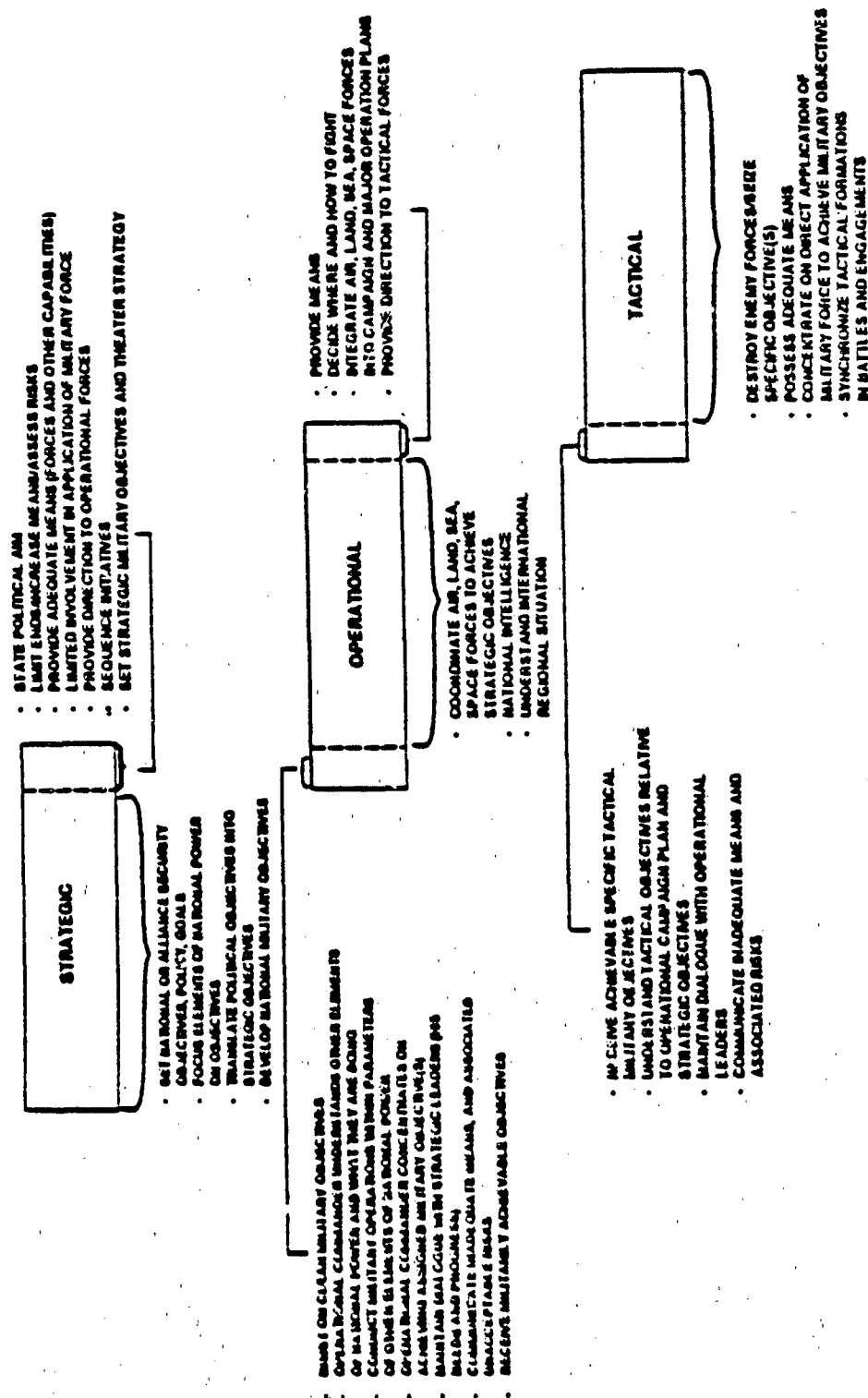


Figure 3-1. Levels of War are Related but Distinctive



ANNEX C: Campaign Plan Format APPENDIX A

FM 100-6, p. A-1

Campaign Plan Format

(SECURITY CLASSIFICATION)

Copy No \_\_\_\_\_

Issuing Headquarters

Place of Issue

Date/Time Group of Signature

CAMPAIGN PLAN: (Number or Code Name)

Reference: Maps, charts, and other relevant documents

TASK ORGANIZATION. Refer to appropriate TPFDD.

# 1. SITUATION.

a. Enemy Forces. Provide a summary of pertinent intelligence data including information on the following:

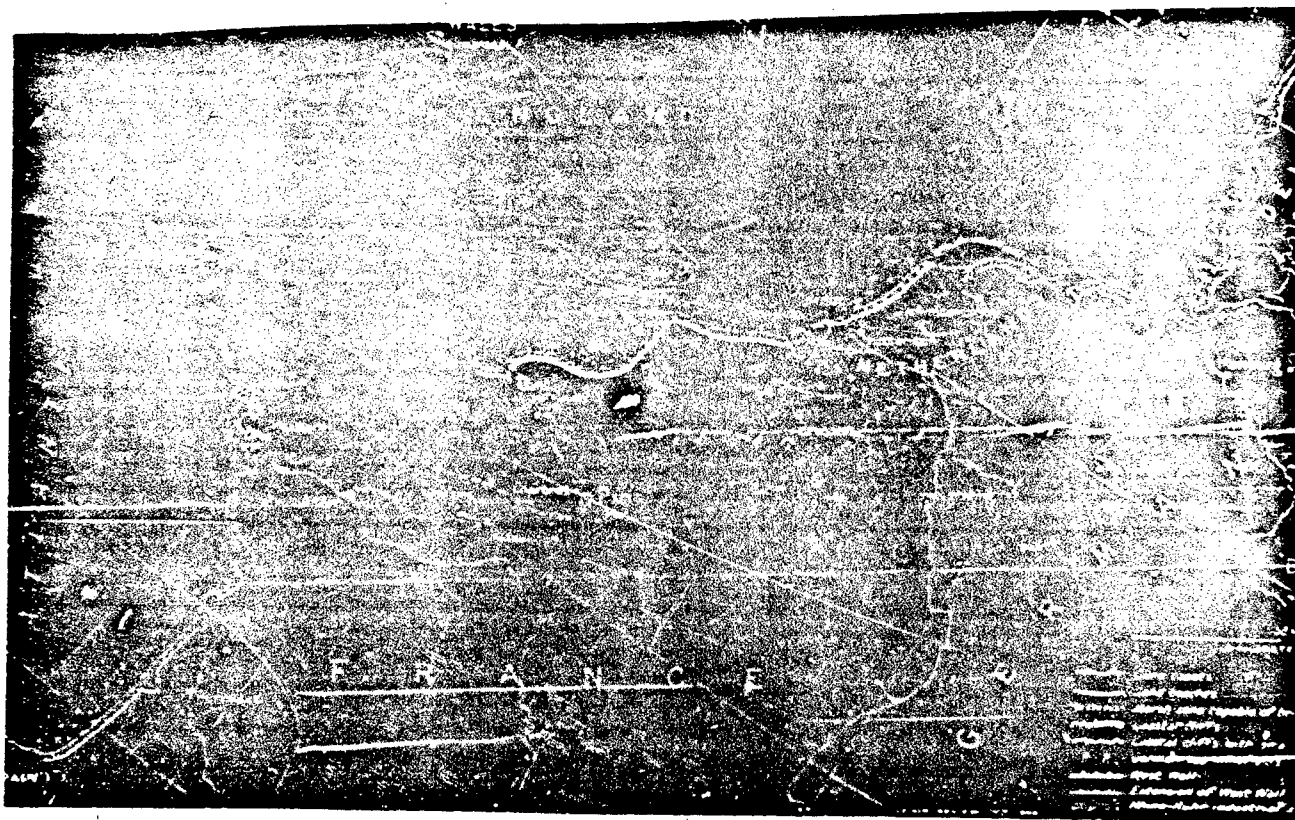
- (1) Composition, location, disposition, movements, and strengths of enemy forces.
- (2) Most probable course of action.
- (3) Major objectives.
- (4) Commander's idiosyncrasies and doctrinal patterns.
- (5) Operational and sustainment capabilities.
- (6) Vulnerabilities and culminating points.
- (7) Centers of gravity.

Assumed information should be identified as such. References may be made to the intelligence annex for more detailed information to include a discussion of geography and weather.

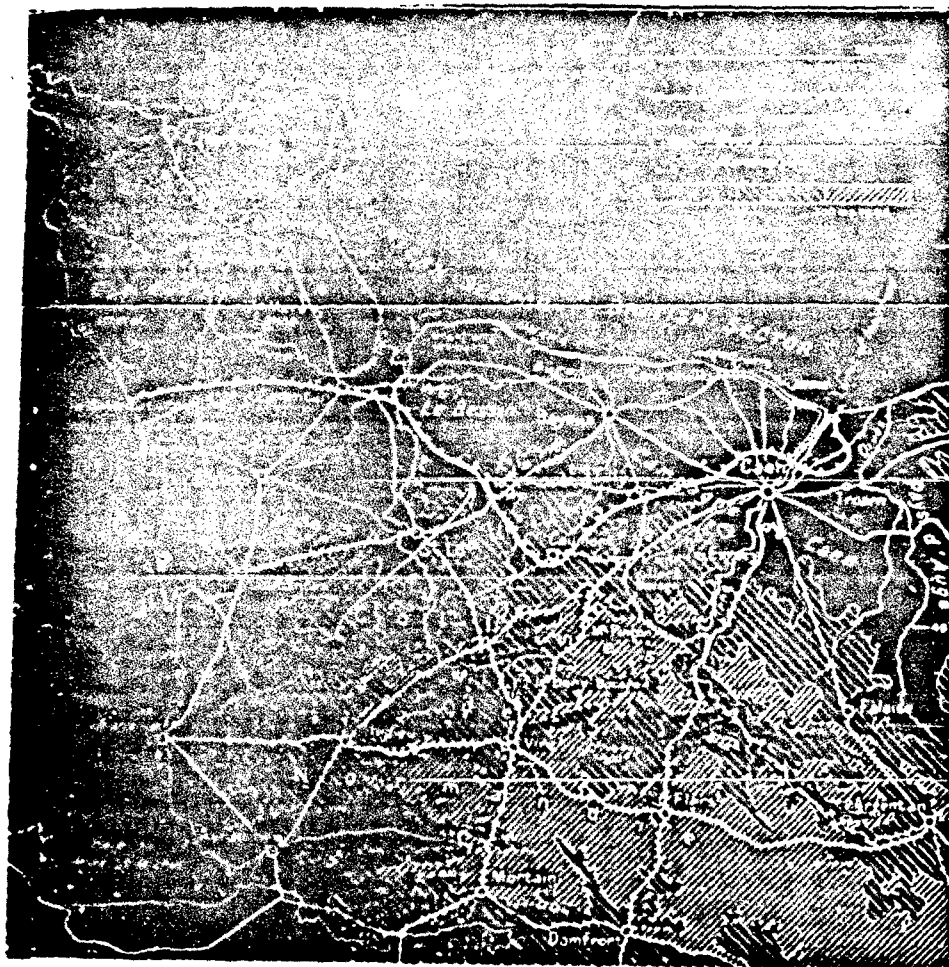
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ANNEX D: Northwest Europe "Upside Down"

"Geographical Factors in the Invasion and Battle of Normandy", p. 614



ANNEX E: The Cotentin Peninsula  
"Geographical Features in the Invasion and Battle of Normandy", p. 619



## ENDNOTES

### INTRODUCTION

1. This discussion of the meaning of coup d'oeil is taken from Frederick the Great's Instructions. (pp.338-342). Frederick is very clear that coup d'oeil is a practiced skill about the relationship between terrain, troops, and the enemy.
2. Edmund R. Thompson, "The Nature of Military Geography: A Preliminary Study." Syracuse University Master's Thesis, 1963. p. 13
3. Louis Peltier and G. Etzel Percy, Military Geography. (Princeton, N.J., D. Van Nostrand Company Inc., 1963), p. 8
4. John R. Brinkerhoff, "The Nature of Modern Military Geography." Columbia University Master's Thesis, 1963. pp. 1112.
5. Thompson, "The Nature of Military Geography", p. 21.
6. In addition to Brinkerhoff and Thompson cited above, see J. B. Green, "Military Geography: Tactical Terrain Analysis." Florida State University Master's Thesis, 1979.
7. Thompson, "The Nature of Military Geography", p. 217.
8. James A. Marks, "In Search of the Center of Gravity: Operational Intelligence of the Battlefield." School of Advanced Military Studies monograph, 7 June 1990, p. 41. Marks adapted the model from FM 34-130, (Intelligence Preparation of the Battlefield). The outer rings were added to Mark's model by the author to clarify the relationship between geography and intelligence in the process.
9. The complaint with an unsatisfactory construct for operational IPB was evidenced throughout the 1990-91 academic year in operational exercises conducted at the School of Advanced Military Studies. During a Southwest Asia exercise notionally conducted in Oman, in a post-CFE NATO exercise, and in a exercise conducted in the fictitious country of Mesopotamia, students assigned to the intelligence staff had difficulty applying the 1:50,000 terrain analysis techniques of tactical IPB to the thousands of miles of terrain considered at the operational level of war.

### THE NATURE OF COUP D'OEIL

1. T. Miller Maguire, The Outlines of Military Geography. (Cambridge, U.K., Cambridge University Press), p. 9.
2. Lloyd Lewis, Sherman: Fighting Prophet. (New York, Harcourt Brace and Company, 1932), p. 72.
3. References to Sherman's sense of military geography were found in Maguire

(1899), Liddell Hart (1935), and Thompson (1963)

4. Frederick, The Instructions of Frederick the Great to his General, 1747. trans. Brig Gen. Thomas R. Phillips. Roots of Strategy, vol 1. (Harrisburg, PA., Stackpole Books, 1985), p. 338.

5. David G. Chandler, The Campaigns of Napoleon. (New York, MacMillan, 1966), p. 145.

6. FM 100-5 (Operations) (Washington, D.C., GPO, 1986), p. 76.

7. Brinkerhoff, "The Nature of Modern Military Geography", p. 1.

8. Frederick, Instructions, p. 341.

9. Ibid. pp. 341-342.

10. Antoine Henri Jomini, Jomini and His Summary of the Art of War. ed. Brig. Gen. J. D. Hittle. Roots of Strategy. vol 2. (Harrisburg, PA, Stackpole Books, 1985), p. 507.

11. Ibid. p. 555

12. Ibid. p. 554

13. Carl von Clausewitz, On War. trans. and ed. by Micheal Howard and Peter Paret. (Princeton, Princeton University Press, 1984), p. 102.

14. Ibid.

15. Ibid.

16. Ibid.

17. Ibid.

18. Ibid. p. 103.

19. Ibid. p. 109.

20. Ibid. p. 578.

21. Ibid.

22. See William S. Lind, Maneuver Warfare Handbook, (Boulder, Westview Press, 1985) and B. H. Liddel Hart, Strategy, (New York, Signet Classics, 1974).

23. Sun Tzu, The Art of War. trans. Samual B. Griffith. (Oxford, Oxford University Press, 1971), pp. 43-44.

24. Ibid. p. 88

25. Ibid. p. 138.

THE EXERCISE OF COUP D'OEIL

1. Bruce Catton, This Hollowed Ground. (New York, Washington Square Press, 1961)
2. Some confusion exists in the use of the terms "operational art" and the "operational level of war". This is due in part to the way the terms were used in FM 100-5 (Operations). The 1982 edition used "operational level of war". The 1986 edition used "operational art". Ronald D'Amura, "Campaigns: The Essence of Operational Warfare.", Military Review vol XVII no. 2 (Summer 1987) suggests "...they are interchangeable terms used to describe warfare that achieves strategic aims." (p. 44. For clarity, the following distinction will be made and apply to the use of the terms in this monograph: "One must differentiate between operational art and the operational level of war. The former is an activity while the latter is a perspective of warfighting in which tactical events are linked to strategic consequences. Hence, the operational level holds the middle ground between strategy and tactics and is usually the province of large units". Bob Epstien, "'ASMP Course 4 Syllabus: The Historical Practice of Operational Art, Academic Year 1990/1991." p. 4-1.
3. Edward Hagerman, The American Civil War and the Origins of Modern Warfare: Ideas, Organization, and Field Command. (Bloomington, IN, Indiana University Press, 1988), p. 293.
4. Ibid.
5. G. Murphy Donovan, "Sustaining the Military Arts.", Parameters, vol. XIX no. 3 (September, 1989), p. 22.
6. L. D. Holder, "A New Day for Operational Art.", Army, (March, 1985), p. 22.
7. Ibid.
8. FM 34-130 (Intelligence Preparation of the Battlefield) (Washington, D.C., GPO, 1989), p. 1-1.
9. Two recent examples are, Douglas A. Campbell, "The Real IPB Doctrine.", Military Review, vol LXX no. 10 (October, 1990), pp. 84-87, and Douglas Campbell and Robert McKinny, "Predictive Intelligence: An Old Lesson Unlearned.", Military Review, vol LXX, no. 8, (August 1990), pp. 50-59.
10. Patrick O'Sullivan and Jesse Miller, Jr., The Geography of Warfare. (New York, St. Martin's Press, 1983), p. 24.
11. J.F.C. Fuller, "The Future of Military Engineering.", Royal Engineer Journal, vol 42 (1928), pp. 29-27.
12. Charles Erdmann, "Application of Geology to the Principles of War.", Bulletin of the Geological Society of America, vol 54, (August, 1943), p.

1182. Sonne's original work is, "Geologische und Militargeologische Karten", Preuss. Geol. Landesanstalt, Jahrb. 1935, Bd. 56, Heft 1, pp. 192-195. I was unable to secure an English translation of this seminal work. Anyone interested in pursuing the history of the development of the IPB process would require this source.

13. Formal doctrine is fuzzy concerning which staff officer or staff section produces which product in the IPB process. The ambiguity centers on the issue of who is to produce the Decision Support Template and the Event Template. The sequence described in this monograph reflects the current methodology taught by the Tactics Division of the US Army Command and General Staff College, academic year 1990-91. It is clear at CGSC that the entire staff participates in the wargaming process. It is from this process that the commander selects his friendly course of action. The 34 series Field Manuals (Intelligence) reflect that the DST and ET should be produced by the intelligence officer prior to the commander selecting his course of action. Practical experience suggests that the only reasonable basis for the development of the final DST and ET would be the commander's decision on a course of action.

14. Harold Nelson, "Space and Time in On War". Clausewitz and Modern Strategy. ed. Micheal Handel. (London, Frank Cass and Co., 1986), p. 134. Mr. Nelson observes... "While considerations of space and time in On War are sophisticated and filled with implications for modern soldiers, Clausewitz did not see these factors as the central elements of his theory of war... he asserted that the truly decisive factor was the personality of a commander in his interaction with the enemy- that commander's ability to appraise the opponent accurately, to energize his own force for rapid movement and bold attack, and to risk that force in the uncertainty of decisive battle." Though coup d'oeil certainly meant more than "an eye for the ground" to Clausewitz, the prominence of a geographic component is inescapable.

15. Clausewitz, On War, p. 109. emphasis in original text.

16. Jomini, Art, p. 494.

17. Ibid. p. 461.

18. Sun Tzu, Art of War, p. 99.

19. Ibid. p. 128. This quote is followed shortly by the famous quote, "Know the enemy, know yourself: your victory will never be endangered. Know the ground, know the weather; your victory will then be total." Though this a much more frequently cited observation about the role of intelligence, it misses the more relevant point considered in this monograph. How do you know these things?

20. Clausewitz, On War, p. 109.

#### CLASSICAL COUP D'OEIL VS. OPERATIONAL COUP D'OEIL

1. O'Sullivan and Miller, Geography of Warfare, p. 56.

2. James Schneider, "The Theory of Operational Art.", Theoretical Paper No. 3. (Draft Editorial Use Only), School of Advanced Military Studies, March 1988.
3. Chandler, Napoleon, p. 161.
4. Clausewitz, On War, p. 177.
5. Micheal Howard, Clausewitz. (Oxford, Oxford University Press, 1983), p. 44.
6. Jomini, Art of War, p. 460.
7. Sun Tzu, Art of War, p. 35.
8. Schneider, "Theoretical Paper", p. 9.
9. Howard, Clausewitz, p. 45.
10. Schneider, "Theoretical Paper", p. 15.
11. US Marine Corps Manual FMFM 1-1 (Campaigning) (Washington, D.C., GPO, 1990), p. 6.
12. David Jablonsky, "Strategy and the Operational Level of War." The Operational Art of Warfare Across the Spectrum of Conflict. (Carlisle, PA, US Army War College Press, 1987), p. 5.
13. FM 100-6 (Large Unit Operations) Coordinating Draft. (US Army Command and General Staff College, 1987), p. vii.
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